OM-1584 139 168T
September 2001

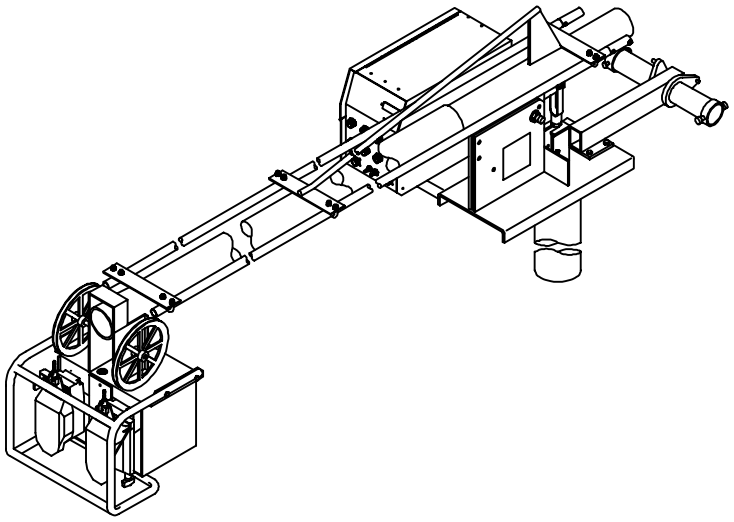
Processes

MIG (GMAW)
Flux Cored (FCAW)
(Gas- and Self-Shielded)
Submerged (SAW)

Description

Wire Feeder
(Use with CV Power Sources)

Swingarc™



DS-12 and DS-16

OWNER'S MANUAL

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller® *The Power of Blue.*

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WARRANTY

⚠ WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

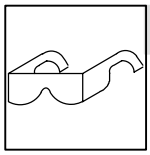
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

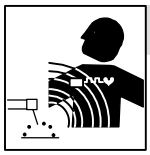
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

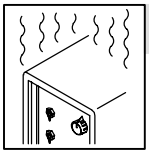
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

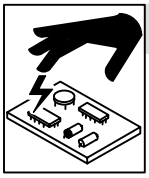
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

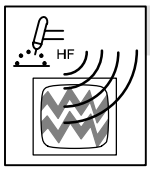
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

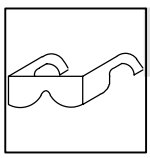
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

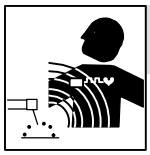
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



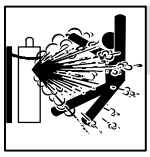
LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.



Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

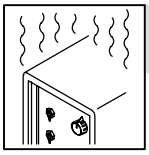
1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

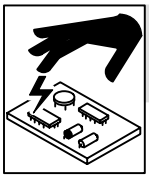
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

DES ORGANES MOBILES peuvent provoquer des blessures.

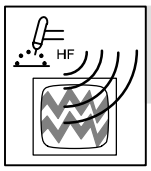
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

SECTION 2 – INTRODUCTION

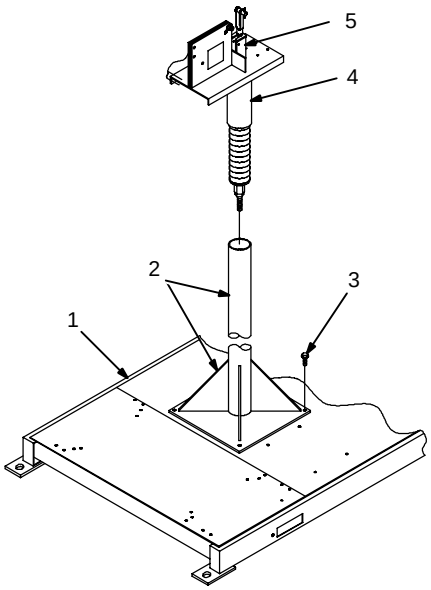
2-1. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Welding Circuit Rating	Weight
24 Volts AC Single-Phase 10 Amperes 50/60 Hertz	Constant Voltage (CV) DC With 14-Pin And Contactor Control	Standard: 50 To 780 ipm (1.3 To 19.8 mpm) Optional High Speed: 92 To 1435 ipm (2.3 To 36.5 mpm)	.023 To 1/8 in (0.6 To 3.2 mm) Max Spool Weight: 60 lb (27 kg)	100 Volts, 750 Amperes, 100% Duty Cycle	12 ft (3.7 m): 207 lb (94 kg) 16 ft (4.9 m): 280 lb (127 kg)

	12 ft (3.7 m) Boom	16 ft (4.9 m) Boom
Maximum Height With 4 ft (1.2 m) Post	17 ft (5.2 m)	21 ft (6.4 m)
Vertical Lift Of Boom	Horizontal to 60° Above Horizontal	Horizontal to 60° Above Horizontal

SECTION 3 – INSTALLATION

3-1. Installing Swivel Into Pipe Post



1 Swingpak Base or CBC Cart

2 Pipe Post With Base

3 Steel Bolt

Secure as shown using as a minimum 1/2 in diameter SAE grade 5 steel bolts.

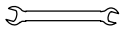
4 Swivel Assembly

Insert into pipe post. Lubricate swivel.

5 Safety Collar

▲ **Do not remove until instructed to.**

Tools Needed:



3/4 in

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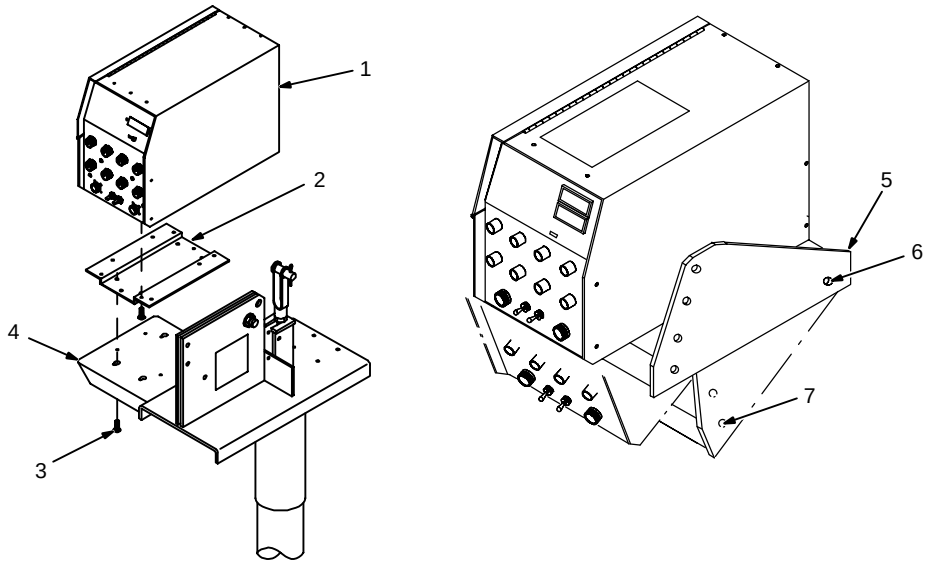
3-2. Installing Control Box And Adjusting Tilt



1 Weld Control

2 Bracket

3 Screw

Bracket and screws are installed onto bottom of control at factory.

4 Swivel

Loosen screws. Place control on swivel and slide forward. Tighten screws.

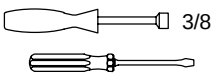
5 Tilt Bracket

6 Rear Pivot Screw

7 Front Screw

Loosen rear pivot screw. Remove front screw. Pivot control downward to desired viewing angle. Replace and tighten front screw. Tighten pivot screw.

Tools Needed:



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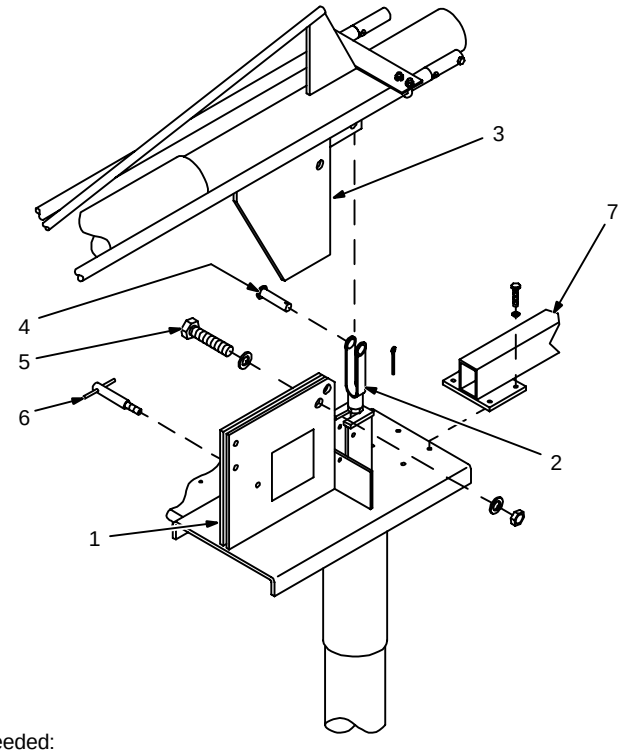
3-3. Installing Boom And Reel Support



1 Swivel Plates

2 Yoke

Remove hardware from swivel plates and yoke.

3 Boom

Set boom into swivel as shown.

4 Yoke Pin

Install pin through yoke. Install cotter pin and spread ends.

5 Bolt

Install bolt, washers, and nut. Tighten hardware, and back bolt off one half turn.

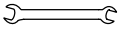
6 Locking Knob

Install locking knob but do not tighten.

7 Reel Support

Install reel support.

Tools Needed:



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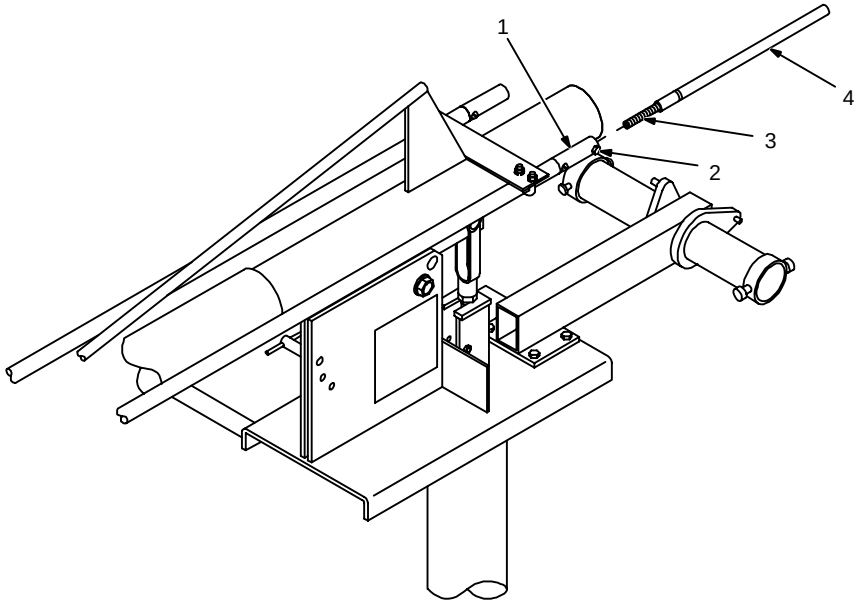
3-4. Installing Wire Guide Extension



1 Wire Guide Fitting
2 Bolt
3 Monocoil Liner
4 Wire Guide Extension

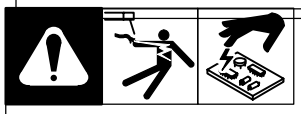
Tighten bolt to secure liner in wire guide fitting. Do not overtighten bolt and crush liner.

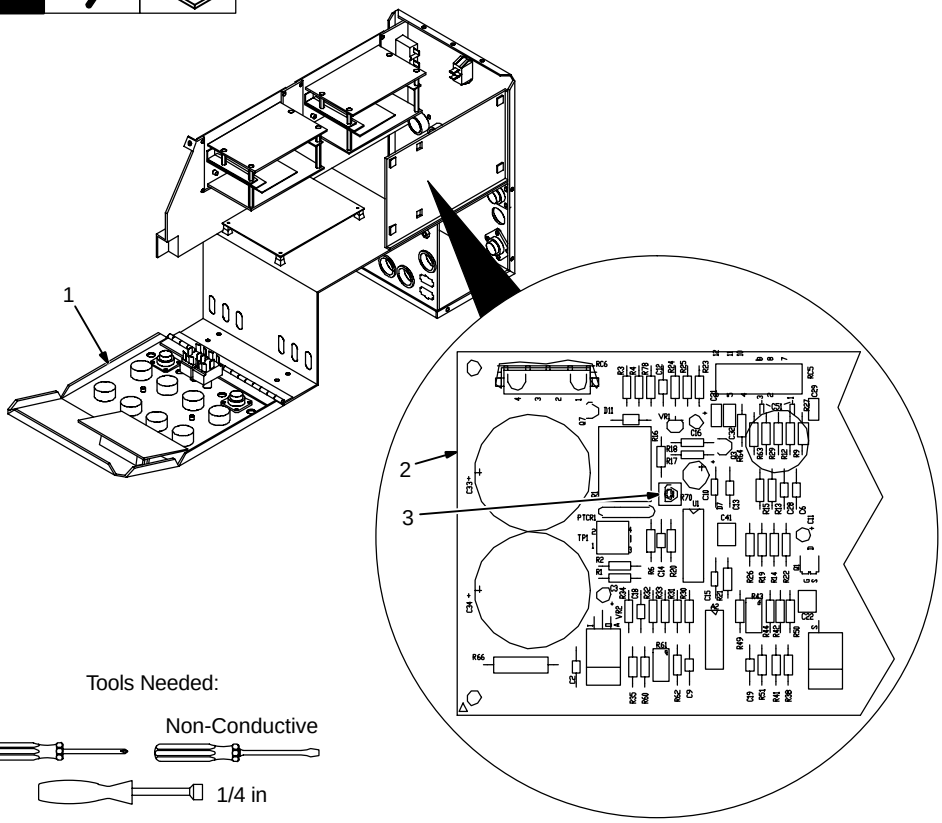
Repeat procedure for opposite side.

Tools Needed:

ST-152 383

3-5. Motor Start Control





To change wire feed starting speed proceed as follows:

Turn Off wire feeder and welding power source.

Remove wrapper.

1 Front Panel

Front panel shown open for illustration purposes.

2 Motor Board PC1

3 Motor Start Control Potentiometer R70

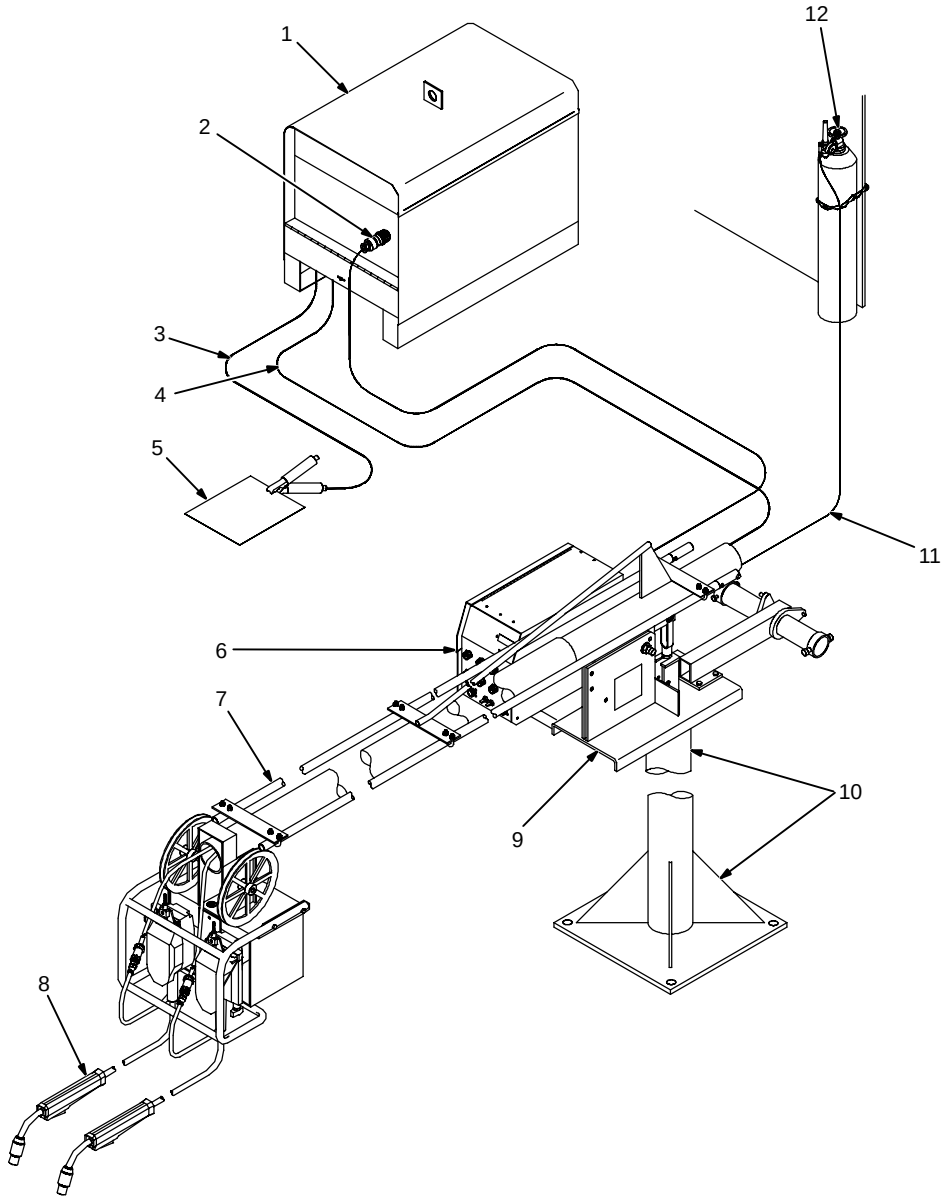
Turn potentiometer clockwise to increase time it takes the motor to ramp up to speed. Remove protective white rubber cap before making adjustment. Adjust potentiometer R70 using a small nonconductive screwdriver.

Reinstall wrapper.

Tools Needed:

Ref. 142 710-B / Ref. SB-183 121-C

3-6. Equipment Connection Diagram



1 Welding Power Source
2 Remote 14 Connection
3 Negative (–) Weld Output Cable
4 Positive (+) Weld Output Cable
5 Workpiece
6 Weld Control
7 Boom
8 Gun
9 Swivel
10 Pipe Post And Base
11 Gas Hose
12 Gas Supply

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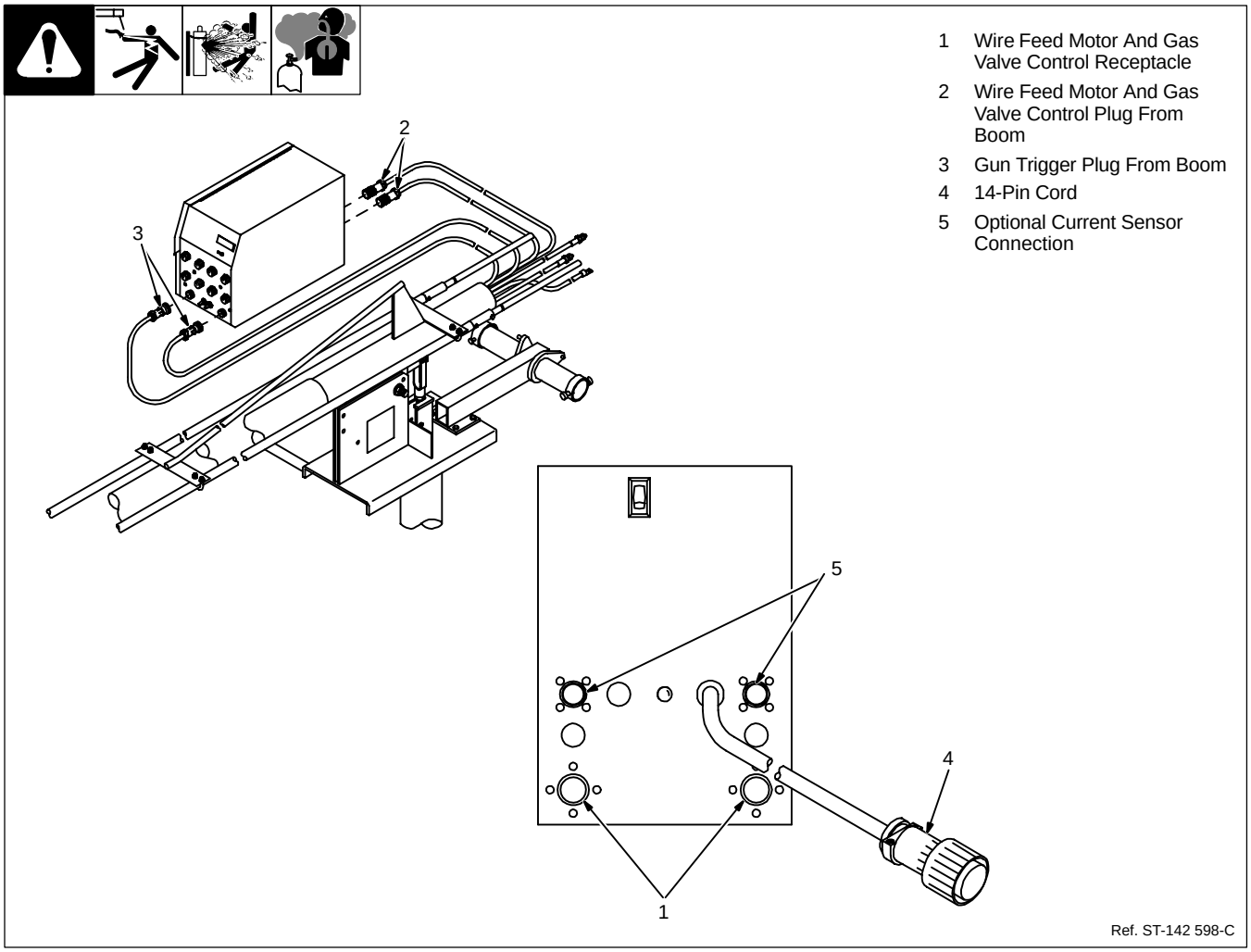
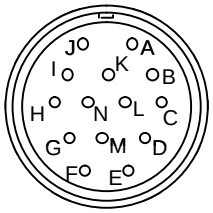
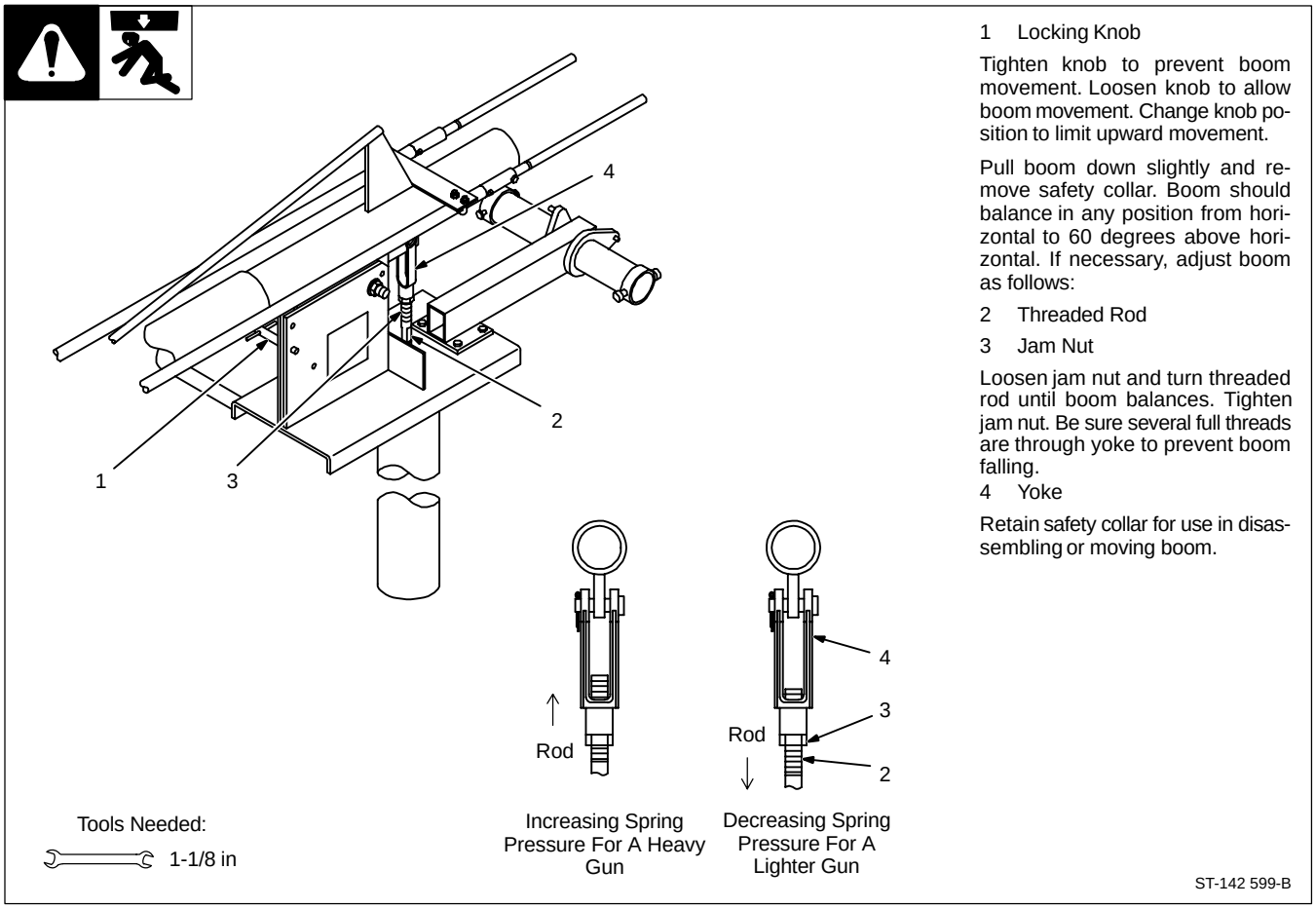
3-7. Control Box Connections



3-8. 14-Pin Plug Information

REMOTE 14	Pin*	Pin Information
	A	24 volts ac with respect to socket G.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
	G	Circuit common for 24 volts AC circuit.
	C	+10 volts dc output to remote control with respect to socket D.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control with respect to socket D.
	H	Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts.
	F	Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes.
*The remaining pins are not used.		

3-9. Removing Safety Collar And Adjusting Boom



1 Locking Knob

Tighten knob to prevent boom movement. Loosen knob to allow boom movement. Change knob position to limit upward movement.

Pull boom down slightly and remove safety collar. Boom should balance in any position from horizontal to 60 degrees above horizontal. If necessary, adjust boom as follows:

2 Threaded Rod

3 Jam Nut

Loosen jam nut and turn threaded rod until boom balances. Tighten jam nut. Be sure several full threads are through yoke to prevent boom falling.

4 Yoke

Retain safety collar for use in disassembling or moving boom.

Tools Needed:

1-1/8 in

Increasing Spring Pressure For A Heavy Gun

Decreasing Spring Pressure For A Lighter Gun

ST-142 599-B

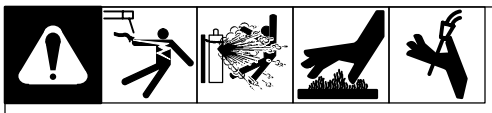
3-10. Gun Recommendation Table

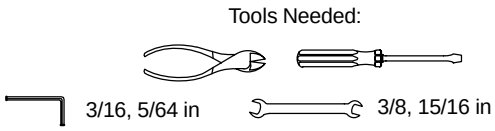
Process	Gun
GMAW – Hard or Cored Wires	Roughneck C-Series Guns: 300, 400, 500, And 600 Amp.
FCAW – Self-Shielding Wires	FC-1260 Or FC-1150

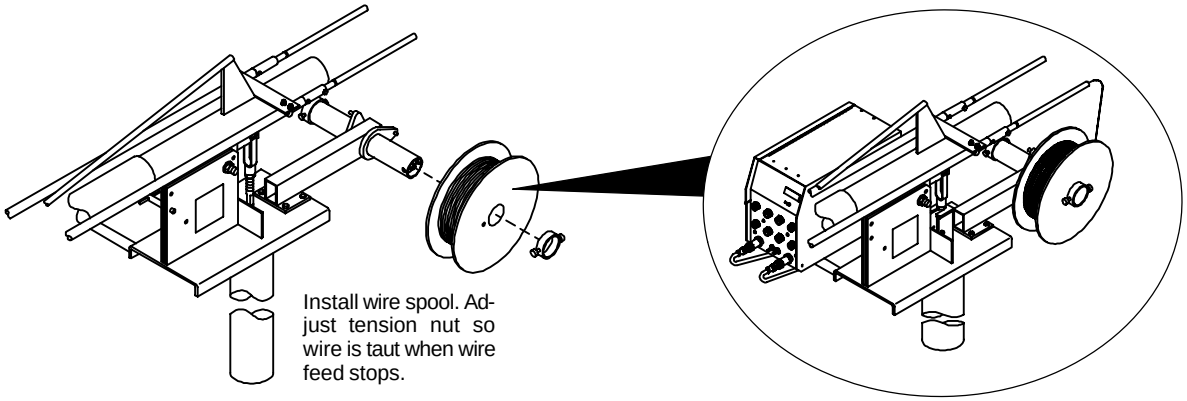
3-11. Wire Type, Size, And Feed Speed Capability Table

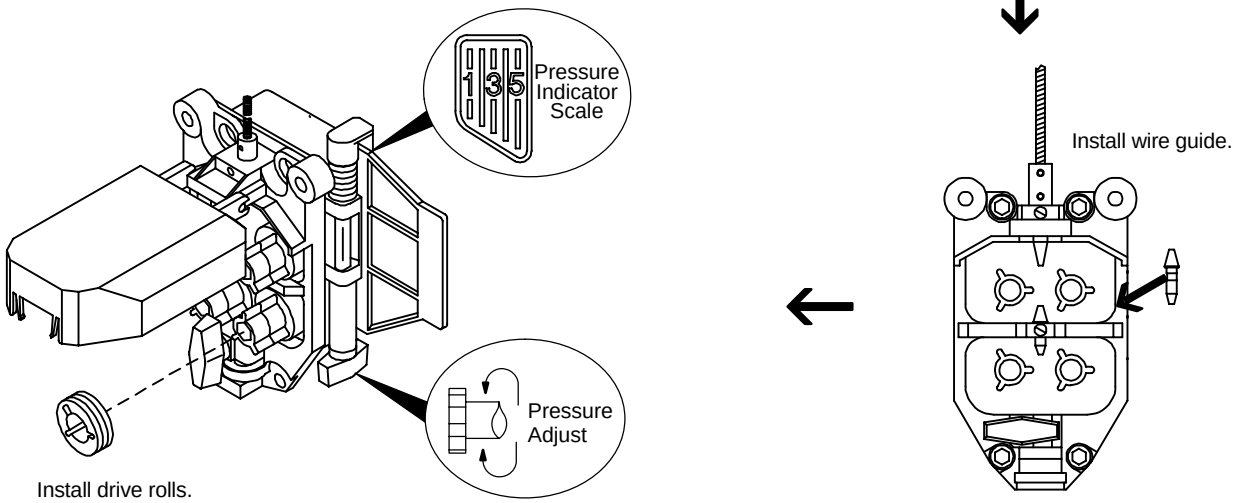
Motor Speed	Wire Type	Wire Size	Feed Speed Capability
Standard	All	.023 To 5/64 in (0.6 To 2 mm)	50 To 780 ipm (1.3 To 19.8 mpm)
Standard	All	3/32 To 7/64 in (2.4 To 2.8 mm)	50 To 700 ipm (1.3 To 17.8 mpm)
Standard	All	1/8 in (3.2 mm)	50 To 300 ipm (1.3 To 7.6 mpm)
Optional High Speed	All	.023 To 5/64 in (0.6 To 2 mm)	92 To 1440 ipm (2.3 To 35.6 mpm)

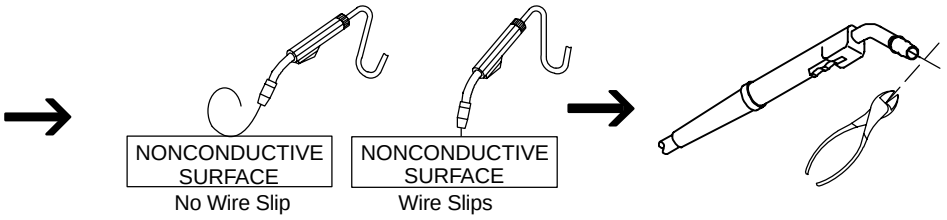
3-12. Installing And Threading Welding Wire











☞ *Be sure that outlet cable has proper size liner for the welding wire size. When installing gun, position liner extending from outlet wire guide as close as possible to drive rolls without touching.*

Install gun. Lay gun cable out straight. Cut off end of wire. Push wire through guides up to drive rolls; continue to hold wire. Press Jog button to feed wire out gun.

☞ *For soft wire or small diameter stainless steel wire, use 2 drive rolls and set drive roll pressure from 0 to a maximum of 4 on the pressure indicator scale (so that only the inner spring is compressed). This setting will generally give the best performance for these types of wires.*

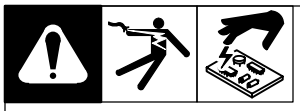
To adjust drive roll pressure, hold nozzle about 2 in (51 mm) from nonconductive surface and press gun trigger to feed wire against surface. Tighten knob so wire does not slip. Do not overtighten. If contact tip is completely blocked, wire should slip at the feeder (see pressure adjustment above).

Cut wire off. Close cover.

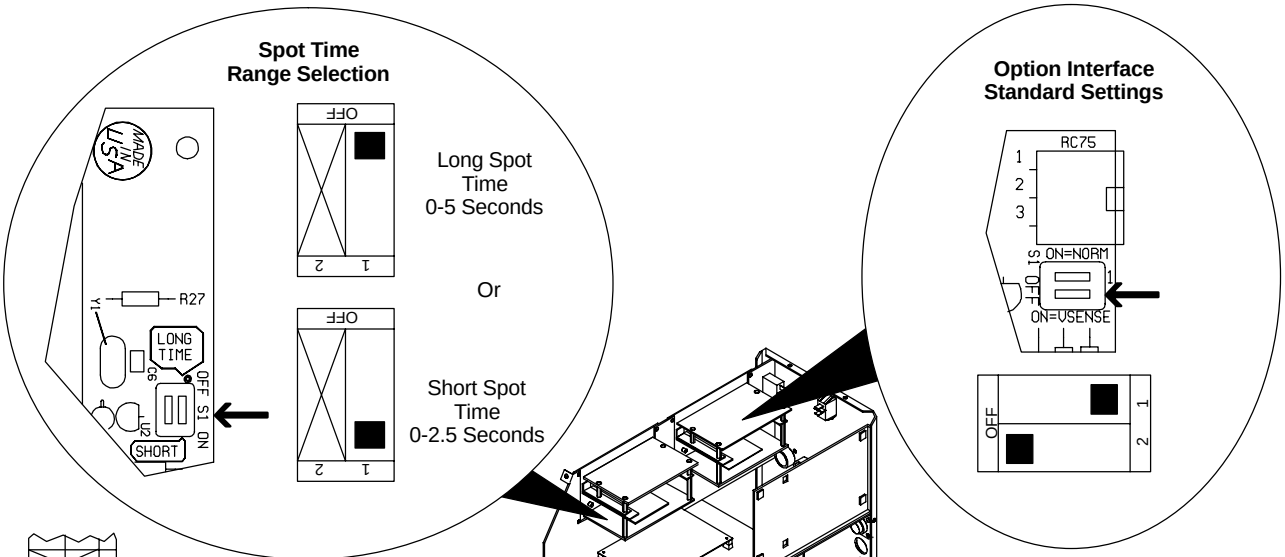
Repeat for other side.

ST-153 171 / ST-153 073 / Ref. ST-137 391-A / ST-142 597-A / Ref. S-0627-A / Ref. ST-150 922

3-13. Optional Equipment DIP Switch Settings

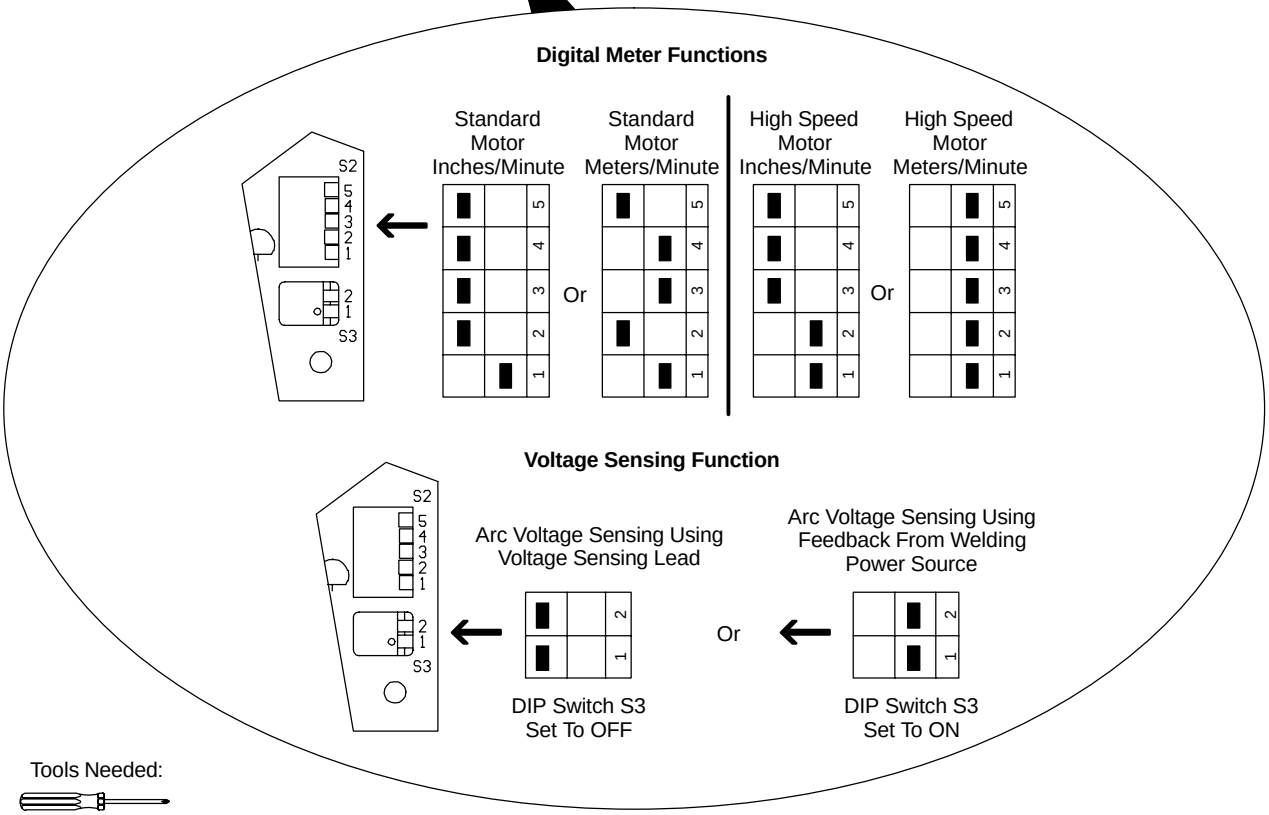


☞ *If wire feeder is equipped with a voltage sensing lead, set DIP switch S3 to the OFF position (up). If wire feeder is NOT equipped with a voltage sensing lead, set DIP switch S3 to the ON position (down).*



X Means switch can be in either position.

▮ Means switch must be in this position.



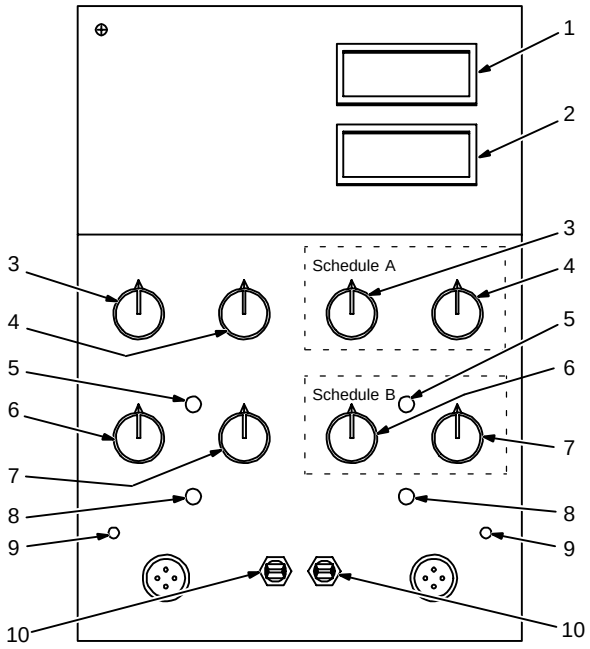
Tools Needed:

1/4 in

Ref. ST-142 710-A / Ref. SA-146 866-B / Ref. SA-148 666-E / Ref. SA-150 588-D

SECTION 4 – OPERATION

4-1. Front Panel Controls



ST-152 647

1 Voltmeter (Optional)

2 Wire Speed Meter (Optional)

Factory set to display inches per minute. If display of meters per minute is desired, see Section 3-13.

3 Schedule A Wire Speed Control

The scale is calibrated in inches per minute x 100 and meter per minute.

4 Schedule A Voltage Control (Optional)

☞ *For dual schedule applications, a dual schedule switch is required for the gun. Obtain a proper dual schedule switch and install according to its instructions.*

5 Schedule B Indicator Light (Optional)

6 Schedule B Wire Speed Control (Optional)

7 Schedule B Voltage Control (Optional)

8 Press To Set Button (Optional)

Press and hold button to preset Schedule B wire feed speed and/or voltage.

9 Left And Right Indicator Lights

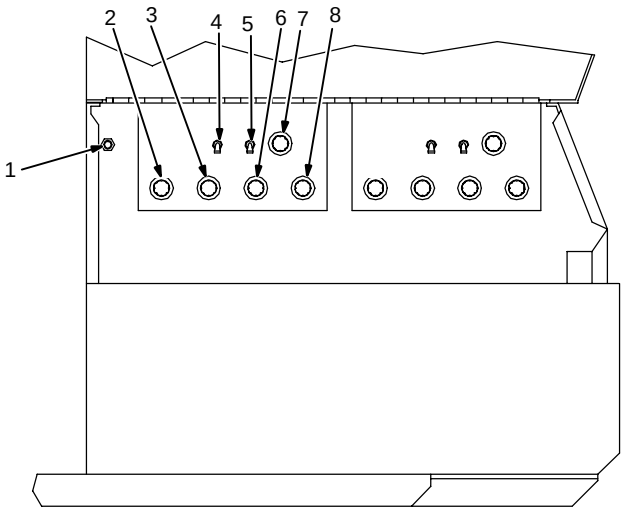
10 Jog/Purge Switch

Push up to momentarily feed welding wire at speed set on Wire Speed control without energizing welding circuit or shielding gas valve.

Push down to momentarily energize gas valve to purge air from gun or adjust gas regulator.

Center position is off.

4-2. Overload Protection And Optional Side Panel Controls



Ref. 802 433-A

1 Circuit Breaker CB1

CB1 protects wire feed motor from overload. Press to reset.

2 Preflow Control

Control sets time gas flows before welding wire is energized.

3 Spot Time Control

Factory set for 0 to 5 seconds of spot time. If 0 to 2.5 seconds is desired, see Section 3-13.

4 Spot Continuous Switch

Switch selects an untimed continuous weld or a timed spot weld.

5 Trigger Hold Switch (Optional)

Push up to weld without holding gun trigger throughout the weld cycle.

To start weld, press and release gun trigger within three seconds after an arc has been struck. To end weld, press and release gun trigger.

6 Burnback Control

Control adjusts time welding wire is energized after wire feed stops.

7 Run-In Control

Control sets run-in wire speed before arc initiation.

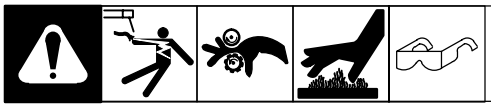
8 Postflow Control

Control sets time gas flows after completion of burnback.

Close side door.

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

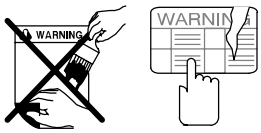
5-1. Routine Maintenance



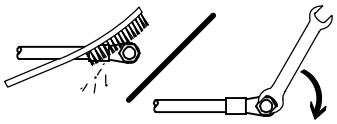
▲ **Disconnect power before maintaining.**

3 Months

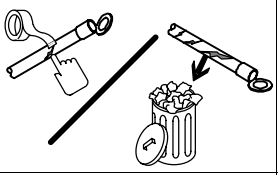
Replace unreadable labels.



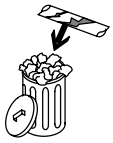
Clean and tighten weld terminals.



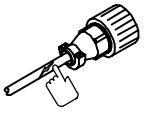
Repair or replace cracked weld cable.



Replace cracked parts.

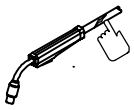


Check 14-pin cord.



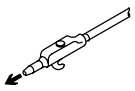
Check gas hose and fittings.

Check gun cable.

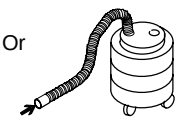


6 Months

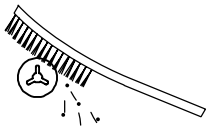
Blow out or vacuum inside. During heavy service, clean monthly.



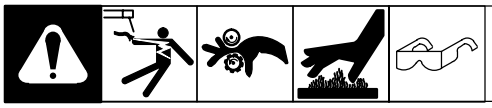
Or



Clean drive rolls.



5-2. Troubleshooting



▲ **Disconnect power before troubleshooting**

Trouble	Remedy
Wire feeds, shielding gas flows, but electrode wire is not energized.	Check interconnecting cord connections. If secure, check cord for continuity and repair or replace (see Sections 3-6 and 3-7).
Wire feeder is on, meter(s) do not light up, motor does not run, gas valve and welding power source contactor do not pull in.	Check and reset CB1 (see Section 4-2).
Electrode wire feeding stops or feeds erratically during welding.	Check gun trigger connection. See gun Owner's Manual.
	Check gun trigger. See gun Owner's Manual.
	Readjust hub tension and drive roll pressure (see Section 3-12).
	Change to correct size drive roll (see Table 7-1).
	Clean or replace dirty or worn drive roll.
	Incorrect size or worn wire guides.
	Replace contact tip or liner. See gun Owner's Manual.
	Remove weld spatter or foreign matter from around nozzle opening.
	Have Factory Authorized Service Agency check drive motor or motor control board PC1.
Motor runs slowly.	Check for correct input voltage.
Wire does not feed until trigger is pulled, but continues to feed after trigger is released, and trigger hold is not on.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Gas valve in feeder is rattling loudly along with possible erratic or slow wire feed speed.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Unit does not switch out of Run-In Speed.	When using this unit with certain older style Miller CV power sources, a weld current sensor (Part No. 160 963) must be used. Power sources include the Deltaweld prior to Serial No. KG141349 and the Dimension prior to Serial No. KC253517
Wire feeder power is on, displays light up, but unit is inoperative.	Check welding gun trigger leads for continuity, and repair leads or replace gun.
Schedule A Wire Feed Speed works, but Schedule B Wire Feed Speed does not work or is erratic.	DIP Switch S1(1) on Option Interface Board PC70 must be in the On position (see Section 3-13).
Wire Feed Speed Meter display does not match actual wire feed speed.	Set DIP Switch S2 on Meter Board PC60 in Inches/Minute mode (see Section 3-13).
Actual arc voltage display on meter is held after trigger is released, or arc voltage does not change while welding.	Set DIP Switch S2 on Meter Board PC60 in Voltage Monitor mode (see Section 3-13).

SECTION 6 – ELECTRICAL DIAGRAM

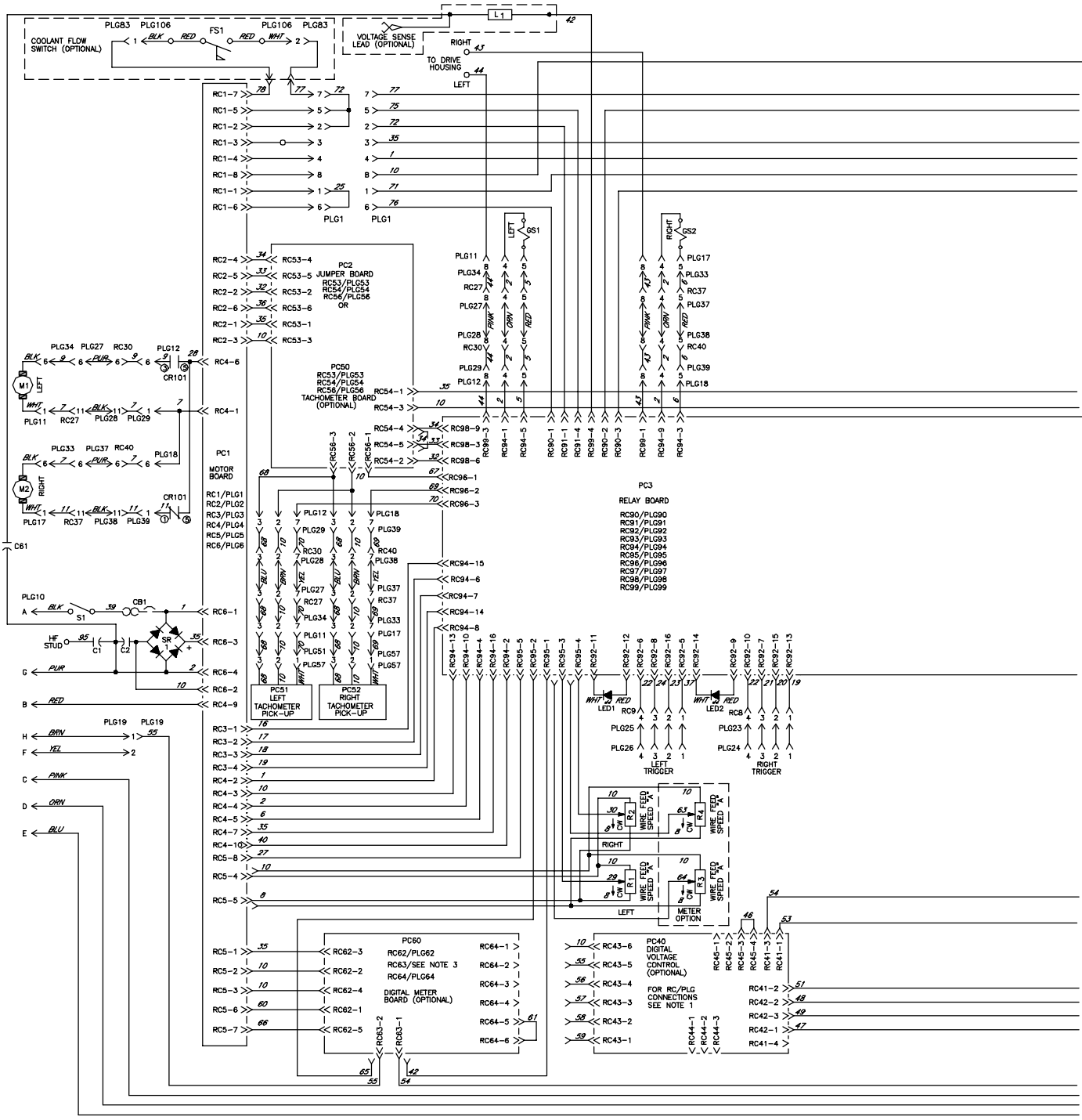
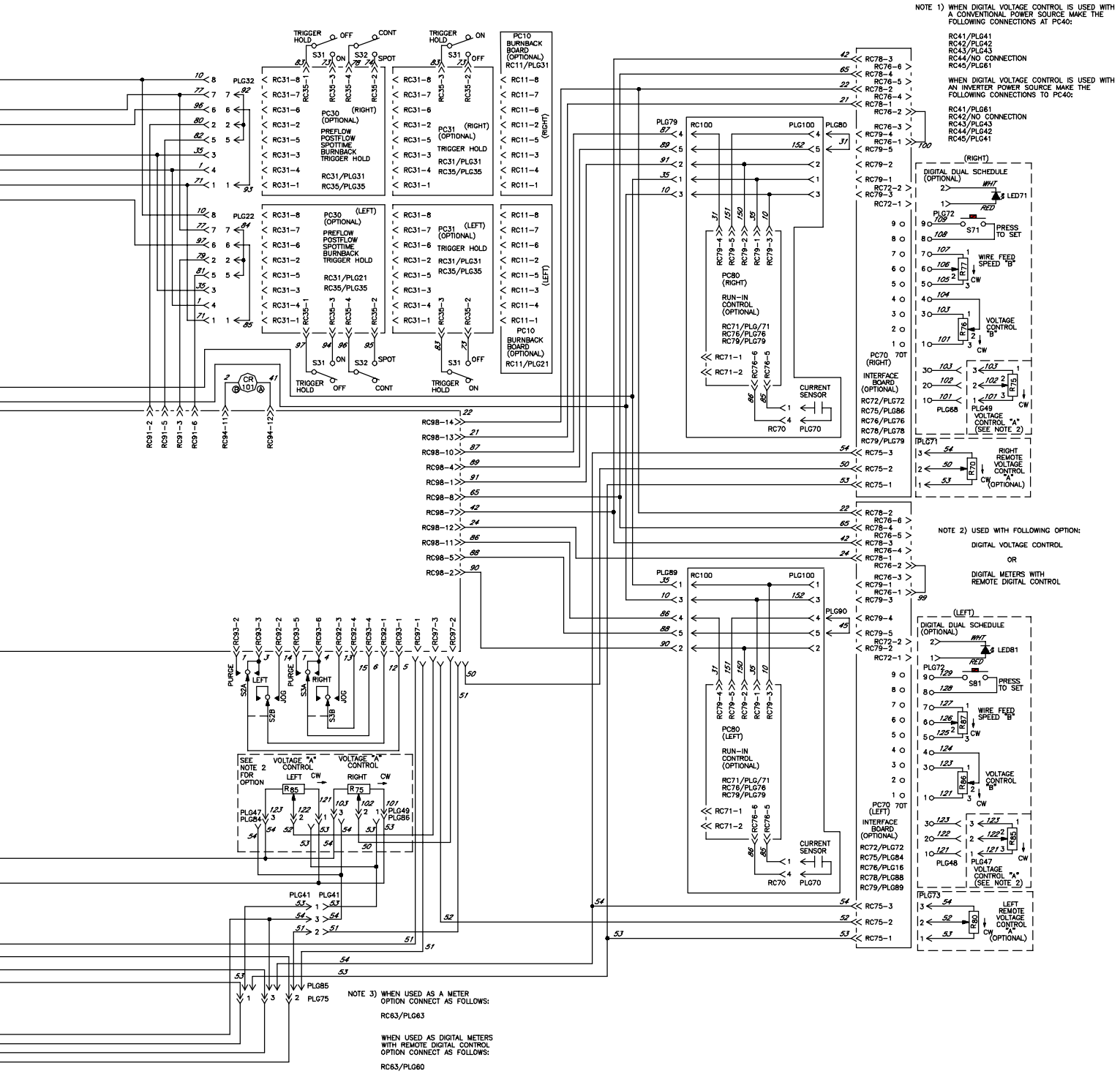


Figure 6-1. Circuit Diagram

⚠ WARNING

ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.



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SECTION 7 – PARTS LIST

☞ *Hardware is common and not available unless listed.*

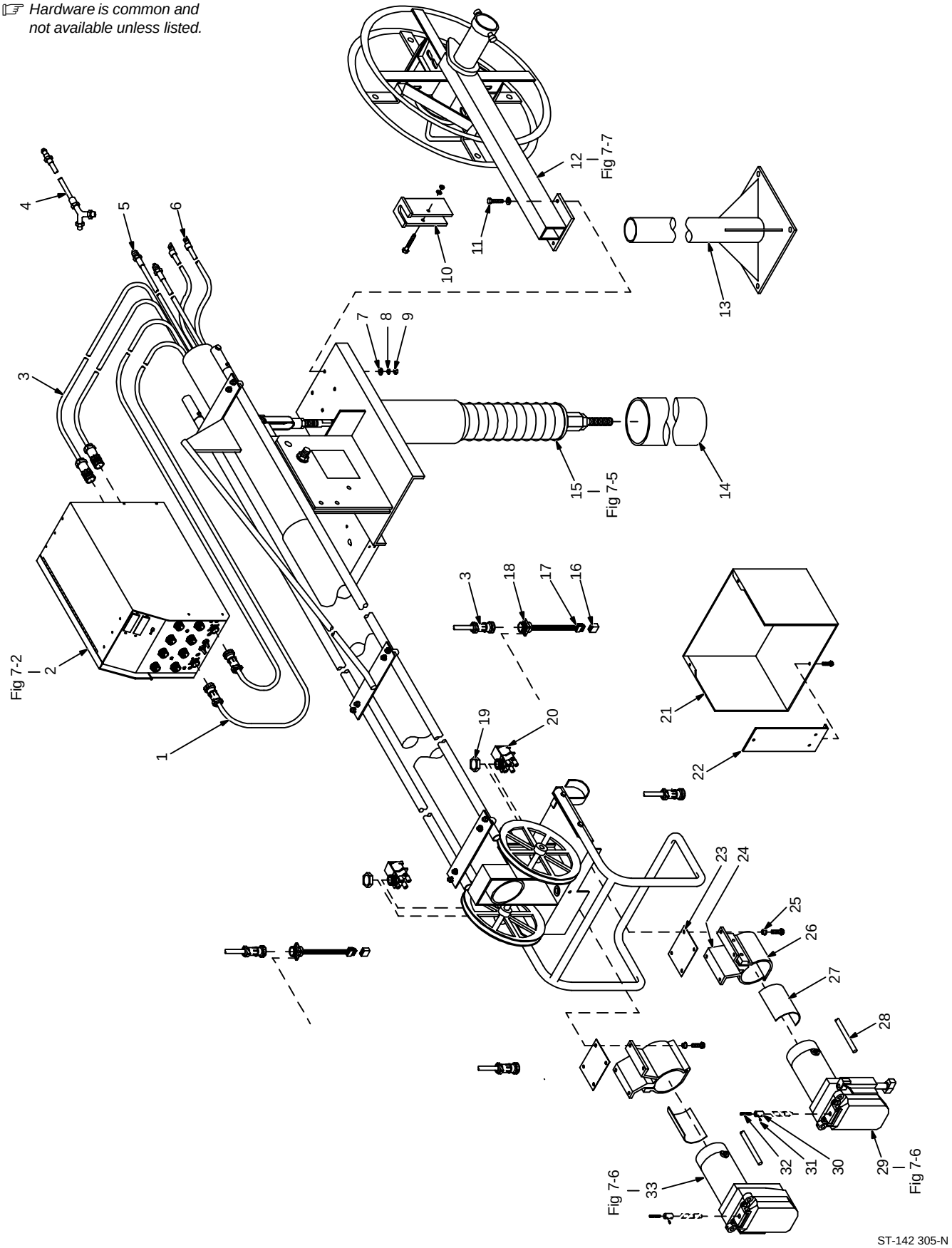

Figure 7-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 12	Quantity Model 16
Figure 7-1. Main Assembly					
1		149 251	CABLE, trigger (consisting of)	2	
1		149 252	CABLE, trigger (consisting of)		2
	PLG23,25	079 878	CONNECTOR & PINS	1	1
		079 531	CONNECTOR, circ clamp str rlf sz 11 Amp 206358-2	2	2
		605 156	CABLE, port No. 18 4/c (order by ft)	17ft	21ft
	PLG24,26	080 328	CONNECTOR w/SOCKETS, free hanging	1	1
2		See Note	CONTROL BOX, (Fig 7-2)	1	1
3		164 475	CABLE, interconnecting (consisting of)	2	
3		164 474	CABLE, interconnecting (consisting of)		2
	PLG27,28,37,38	047 636	CONNECTOR & PINS	2	2
		079 739	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	2	2
		163 519	CABLE, port No. 18/14 8/c (order by ft)	17ft	21ft
4		159 297	HOSE ASSEMBLY, gas	1	1
5		139 600	HOSE, gas	2	
5		139 599	HOSE, gas		2
6		600 324	CABLE, weld cop strd No. 4/0 (order by ft)	26ft	30ft
7		602 243	WASHER, flat stl std .375	8	8
8		602 213	WASHER, lock stl split .375	4	4
9		601 872	NUT, stl hex full .375-16	4	4
10		080 947	BRACKET, spring retaining	1	
10		151 626	BRACKET, spring retaining		1
11		132 053	SCREW, cap stl hexhd .375-16 x 1.500 lg	4	4
12		Fig 7-7	SUPPORT, hub & reel	1	1
13		♦149 838	PIPE POST, 4ft w/base or	1	
13		♦149 839	PIPE POST, 6ft w/base	1	
13		♦078 264	PIPE POST, 4ft w/base or		1
13		♦079 216	PIPE POST, 6ft w/base		1
14		♦075 078	PIPE POST, 4ft w/o base or	1	1
14		♦079 217	PIPE POST, 6ft w/o base	1	1
15		Fig 7-5	BOOM ASSEMBLY	1	1
16	PLG11,17	115 092	CONNECTOR & SOCKETS	2	2
17	PLG33,34	135 409	CONNECTOR & PINS	2	2
18	RC27,37	047 637	CONNECTOR & SOCKETS	2	2
		048 144	CONNECTOR, circ pin plug keying Amp 200821-1	2	2
19		605 227	NUT, nyl hex jam .750NPST	2	2
20	GS1,2	125 785	VALVE, 24VAC 2 way custom port 1/8 orf	2	2
21		139 813	COVER, protector motor	1	1
22		139 816	PANEL, encl cover	1	1
23		159 647	INSULATOR, motor clamp	2	2
24		159 646	CLAMP, motor base	2	2
25		159 360	INSULATOR, screw machine	8	8
26		156 243	CLAMP, motor top	2	2
27		145 639	STRIP, buna N compressed sheet .062 x 4.000sq	2	2
28		134 834	HOSE, SAE .187 ID x .410 OD (order by ft)	3ft	3ft
29		167 774	DRIVE ASSEMBLY, wire RH (w/tach) (Fig 7-6)	1	1
29		♦167 775	DRIVE ASSEMBLY, wire RH (high speed) (Fig 7-6)	1	1
30		157 295	GUIDE, monocoil	2	2
31		604 612	SCREW, set stl sch 8-32 x .125 cup point	4	4
32		082 050	LINER, monocoil inlet wire	2	2
33		167 780	DRIVE ASSEMBLY, wire LH (w/tach) (Fig 7-6)	1	1
33		♦167 781	DRIVE ASSEMBLY, wire LH (high speed) (Fig 7-6)	1	1
33		♦167 782	DRIVE ASSEMBLY, wire LH (high speed w/tach) (Fig 7-6)	1	1
		149 322	CLAMP, hose .405–.485clp	4	4

Note: When ordering Control Box contact factory service department for proper number.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

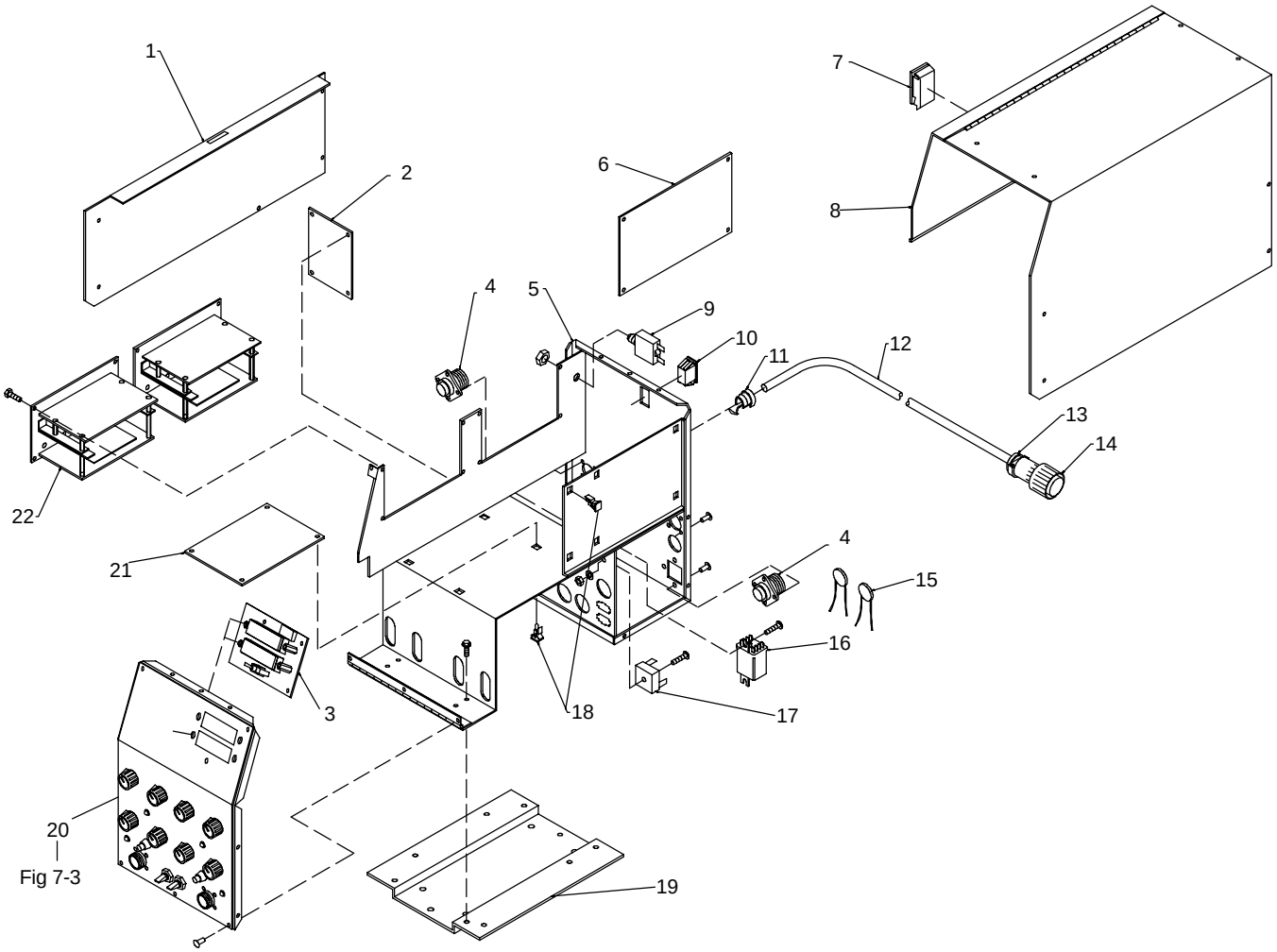

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Figure 7-2. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 7-2. Control Box (Fig 7-1 Item 2)

1		140 010	PANEL, side lower	1
2	PC2	134 994	CIRCUIT CARD, tach jumper	1
	PLG53	115 092	CONNECTOR & SOCKETS	1
	PLG54	115 093	CONNECTOR & SOCKETS	1
	PLG56	131 204	CONNECTOR & SOCKETS	1
		♦180 314	KIT, meter D-60 Digital Display (consisting of)	1
2	PC50	132 370	CIRCUIT CARD, tach converter	1
		097 132	STAND-OFF, 6-32 x .375 lg	4
	R3,4	603 856	POTENTIOMETER, WW sltd sft 10/T 2W 10K ohm (Wire Feed Speed A)	2
	PLG5	130 203	CONNECTOR & SOCKETS	1
	PLG62	131 055	CONNECTOR & SOCKETS	1
	PLG64	167 361	CONNECTOR & SOCKETS	1
	PLG95	115 092	CONNECTOR & SOCKETS	1
		138 045	CONNECTOR & SOCKETS	1
	R75,85	603 856	POTENTIOMETER, WW sltd sft 10/T 2W 10K ohm (Voltage Control A)	2
	PLG84,86,97	131 204	CONNECTOR & SOCKETS	3
	PLG41,47,49,85	131 203	CONNECTOR & SOCKETS	4
	PLG41	115 090	CONNECTOR & SOCKETS	1
	PLG19	151 490	CONNECTOR, rect 21P	1
	PLG60,63	138 045	CONNECTOR & SOCKETS	2
		097 922	KNOB (see Figure 7-3 for additional parts)	2
3	PC60	157 719	CIRCUIT CARD, meter dual	1
	PC51	198 004	CIRCUIT CARD, digital tach (see Figure 7-6)	1
4	RC30,40	047 637	CONNECTOR & SOCKETS	2
	PLG12,18	135 409	CONNECTOR & SOCKETS	2
	PLG29,39	115 092	CONNECTOR & SOCKETS	2
5		139 231	CASE SECTION, bottom/rear	1
6	PC1	198 037	CIRCUIT CARD, motor control	1
	PLG1	115 092	CONNECTOR & SOCKETS	1
	PLG2	115 093	CONNECTOR & SOCKETS	1
	PLG3	115 094	CONNECTOR & SOCKETS	1
	PLG4	115 091	CONNECTOR & SOCKETS	1
	PLG5	130 203	CONNECTOR & SOCKETS	1
	PLG6	136 810	CONNECTOR & SOCKETS	1
7		151 187	LATCH, slide flush	1
8		+140 008	WRAPPER	1
		134 464	LABEL, warning general precautionary	1
9	CB1	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	1
10	S1	111 997	SWITCH, rocker SPST 10A 250VAC (Power Switch)	1
11		010 325	BUSHING, strain relief .840 ID x .875mtg hole	1
12		163 519	CABLE, port No. 18/14 8/c (order by ft)	17ft
13		079 739	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	1
14	PLG10	141 162	CONNECTOR & PINS	1
	PLG19	158 719	CONNECTOR & SOCKETS	1
	PLG75	131 204	CONNECTOR & SOCKETS	1
15	C1,2	147 856	CAPACITOR ASSEMBLY	1
16	CR101	072 817	RELAY, encl 24VAC DPDT	1
17	SR1	035 704	RECTIFIER, integ 40A 800V	1
18		134 201	STAND-OFF SUPPORT, PC card .312	12
19		++145 948	BRACKET, mtg control box	1
20		Fig 7-3	PANEL, front w/components	1
21	PC3	151 147	CIRCUIT CARD, relay	1
	PLG92,94	131 052	CONNECTOR & SOCKETS	2
	PLG93	115 093	CONNECTOR & SOCKETS	1
	PLG95	115 092	CONNECTOR & SOCKETS	1
	PLG96	131 204	CONNECTOR & SOCKETS	1
	PLG99	115 094	CONNECTOR & SOCKETS	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 7-2. Control Box (Fig 7-1 Item 2) (Continued)

. . 22		Fig 7-4	. . CONTROL PANEL	2
		120 304	. . BLANK, snap-in nyl .250mtg hole	11
		119 951	. . BLANK, snap-in nyl .437mtg hole	6
		107 983	. . BLANK, snap-in nyl .500mtg hole	2
		024 103	. . BLANK, snap-in nyl .750mtg hole	1
		000 527	. . BLANK, snap-in nyl .875mtg hole	4

♦OPTIONAL
+When ordering a component originally displaying a precautionary label, the label should also be ordered.
++Not part of Control Box Assembly
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

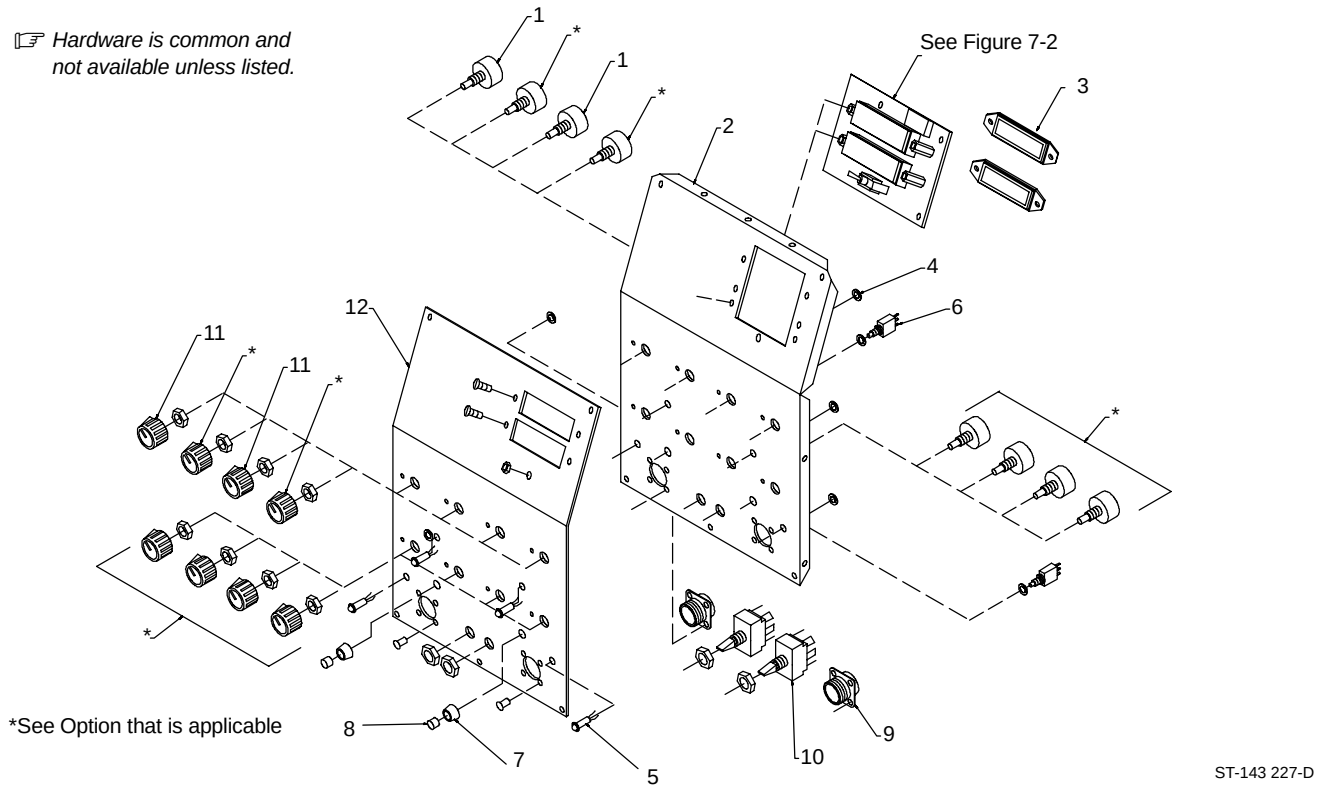


Figure 7-3. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

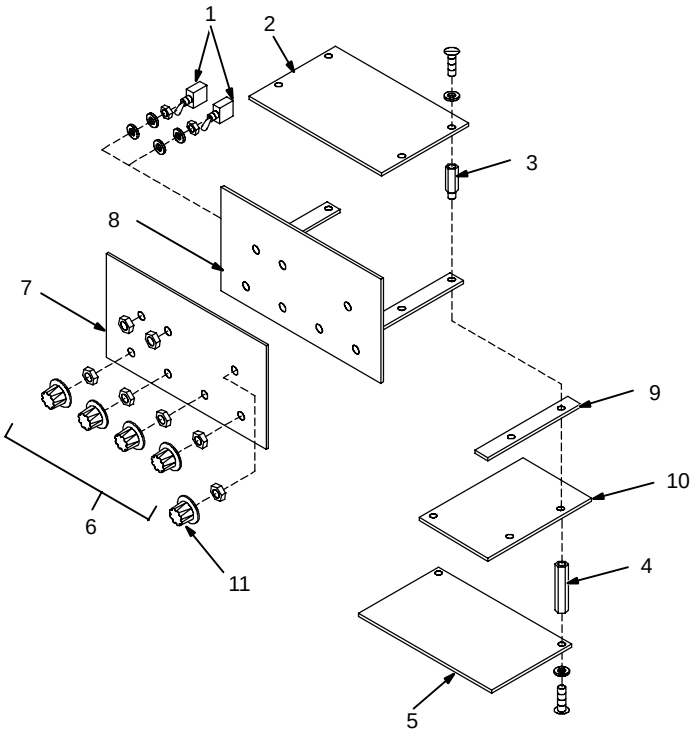
Figure 7-3. Panel, Front w/Components (Fig 7-2 Item 20)

1	R1,2	073 562	POTENTIOMETER, C sltd sft 1/T 2W 10K ohm (Wire Feed Speed A)	2
2		149 654	PANEL, front	1
2		149 654	PANEL, front	1
3		136 339	COVER, opening meter (not used with digital display option)	2
4		134 209	NUT, speed push-on-type .250	2
5	LED1,2	179 203	LED, 5100 2.0V 20mA green	2
		♦172 825	DIGITAL DUAL SCHEDULE, RH (consisting of)	1
		♦173 748	DIGITAL DUAL SCHEDULE, LH (consisting of)	1
4		134 209	NUT, speed push-on-type .250	1
5	LED71/81	179 203	LED, 5100 2.0V 20mA green	1
	PLG68/48	131 204	CONNECTOR & SOCKETS	1
	PLG72	131 054	CONNECTOR & SOCKETS	1
	R76,77/86,87	603 856	POTENTIOMETER, WW sltd sft 10/T 2W 10K ohm (Wire Feed Speed B/Voltage Control B)	2
6	S71/81	150 982	SWITCH, PB MC SPDT 6A 125VAC (Press to Set)	1
7		153 195	NUT, face	1
8		150 981	BUTTON, switch black	1
		097 922	KNOB, pointer	2
			see Figure 7-4 For Additional Parts	
9	RC8,9	048 282	CONNECTOR w/SOCKETS	1
10	S2,3	134 846	SWITCH, tgl SPTT 15A 125VAC (Jog/Purge)	2
11		097 922	KNOB, pointer	2
12			NAMEPLATE, (order by model and serial number)	1

♦OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*



146 340-B

Figure 7-4. Control Panel

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 7-4. Control Panel (Fig 7-2 Item 22)				
1	S31,32	♦011 770	SWITCH, tgl SPDT 6A 125VAC (Trigger Hold/Spot)	2
2	PC70	♦♦150 591	CIRCUIT CARD, option interface	1
	PLG16,54,76	♦♦115 093	CONNECTOR & SOCKETS	3
	PLG78,88	♦♦115 094	CONNECTOR & SOCKETS	2
	PLG79,89	♦♦115 091	CONNECTOR & SOCKETS	1
	PLG80,90	♦♦135 531	CONNECTOR & PINS	1
	PLG98	♦♦131 056	CONNECTOR & SOCKETS	1
3		♦♦115 443	STAND-OFF, 6-32 x .750 lg	4
		♦♦♦138 542	SPOT/BURNBACK PREFLOW/POSTFLOW, RH	1
		♦♦♦138 547	SPOT/BURNBACK PREFLOW/POSTFLOW, LH (consisting of)	1
4		126 689	STAND-OFF, 6-32 x 1.500 lg	2
5	PC30	188 834	CIRCUIT CARD, 4 in 1 timer	1
	PLG1,21,31	115 092	CONNECTOR & SOCKETS	3
	PLG22,32	135 409	CONNECTOR & PINS	2
	PLG35	115 094	CONNECTOR & SOCKETS	1
	PLG90	131 204	CONNECTOR & SOCKETS	1
	PLG91	115 093	CONNECTOR & SOCKETS	1
6		093 551	KNOB, pointer	4
7		180 636	PLATE, control	1
8		133 344	PANEL, option	1
		120 304	BLANK, snap-in nyl .250mtg hole	2
		♦♦♦194 679	RUN-IN CONTROL (consisting of)	1
		153 037	SWITCH, reed	1
		079 878	HOUSING	1
		079 535	TERMINAL	1
		079 531	CLAMP	1
		048 834	CLAMP	1
7		180 636	PLATE, control	1
8		133 344	PANEL, option	1
9		197 153	SPACER, mtg pc board	1
10	PC80	196 746	CIRCUIT CARD, run-in control	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 7-4. Control Panel (Fig 7-2 Item 22) (Continued)

11		093 551	KNOB, .125dia shaft w/.125 set screw	1
PLG16,54,76,76		115 093	CONNECTOR & SOCKETS	4
PLG71,78,88		115 094	CONNECTOR & SOCKETS	3
PLG79,79,89,100		115 091	CONNECTOR & SOCKETS	4
PLG80,90,RC100		135 531	CONNECTOR & PINS	3
PLG98		131 056	CONNECTOR & SOCKETS	1
RC70		048 282	RECEPTACLE & SOCKETS	1
		120 304	BLANK, snap-in nyl .250mtg hole	6
7		180 635	PLATE, control	2

♦Part of Optional 138 542 RH and 138 547 LH Spot/Burnback, Preflow/Postflow

♦♦Part of Optional 172 825 RH and 173 748 LH Digital Dual Schedule

♦♦♦OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

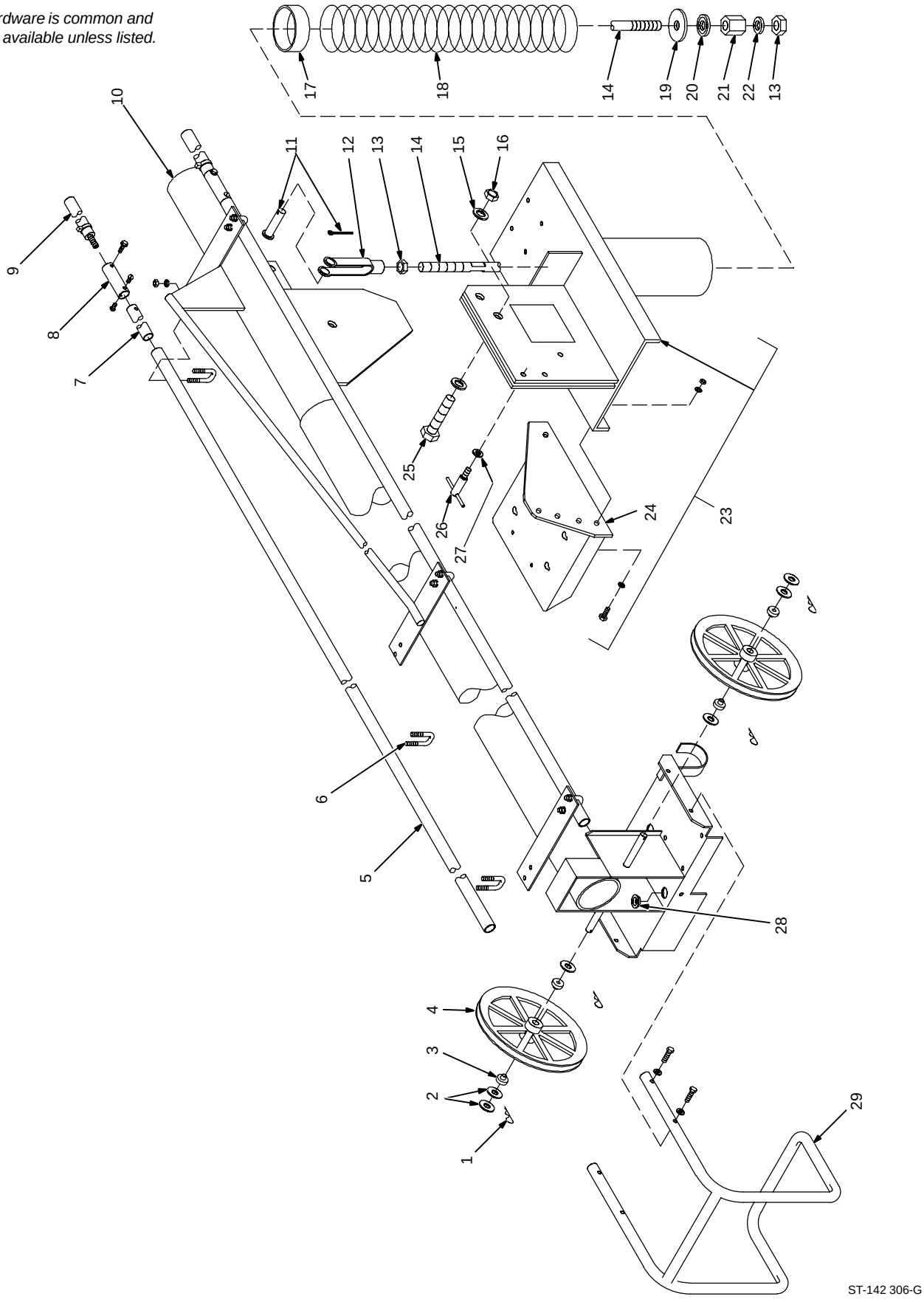


Figure 7-5. Boom Assembly

Item No.	Part No.	Description	Quantity Model 12	Quantity Model 16
		Figure 7-5. Boom Assembly (Fig 7-1 Item 15)		
1	010 313	PIN, cotter hair .072 x 1.437	4	4
2	010 910	WASHER, flat stl SAE .375	6	6
3	079 622	WASHER, shld .381 ID x .750 OD	2	2
4	079 621	PULLEY, V sgl grv 7.750dia x 8.000P x .625 bore	2	2
5	079 667	PIPE, plstc .500 x 133.750	2	
5	080 812	PIPE, plstc .500 x 181.750		2
6	079 632	BOLT, U stl .250-20 x .875 wide x 1.375 deep	8	10
7	079 665	GUIDE, wire	2	
7	080 811	GUIDE, wire		2
8	079 664	GUIDE, wire inlet	2	2
9	139 633	LINER, monocoil 3/32-1/8 wire x 15.687	2	2
10	159 999	BOOM, dual	1	
10	160 513	BOOM, dual		1
11	073 742	PIN, clevis .750 OD x 2.156 lg	1	1
12	073 741	CLEVIS, .812 yoke 6.062 lg .750-16thd	1	1
13	079 029	NUT, stl hex full fnsh .750-16	2	2
14	075 462	SHAFT, boom counterbalance	1	1
15	602 250	WASHER, flat stl SAE .750	2	2
16	079 020	NUT, stl hex elastic stop .750-16	1	1
17	155 335	PIPE, blk 3.000 x .875		1
18	149 858	SPRING, cprsn 3.750 OD x .625 wire x 36.000	1	
18	151 625	SPRING, cprsn 3.750 OD x .640 wire x 36.000		1
19	150 258	RETAINER, spring	1	1
20	024 605	BEARING, ball thr sgl row .750 x 1.625 x .625	1	1
21	075 101	NUT, stl hex special .750-16 x 1.250	1	1
22	079 030	WASHER, lock stl ext tooth .750	1	1
23	+174 754	BASE, swivel boom (consisting of)	1	1
	080 157	FITTING, grease 1/8NPT	1	1
24	174 688	BRACKET, mtg control tilt	1	1
	142 804	LABEL, Swingarc caution heavy spring	1	1
	134 327	LABEL, warning general precautionary	1	1
25	073 666	BOLT, mach stl hexhd .750-16 x 2.750	1	1
26	047 224	KNOB, T-bar .500-13thd	1	1
27	602 246	WASHER, flat stl std .500	1	1
28	010 493	BUSHING, snap-in nyl .625 ID x .875mtg hole	1	1
29	139 818	GUARD, motor protector	1	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

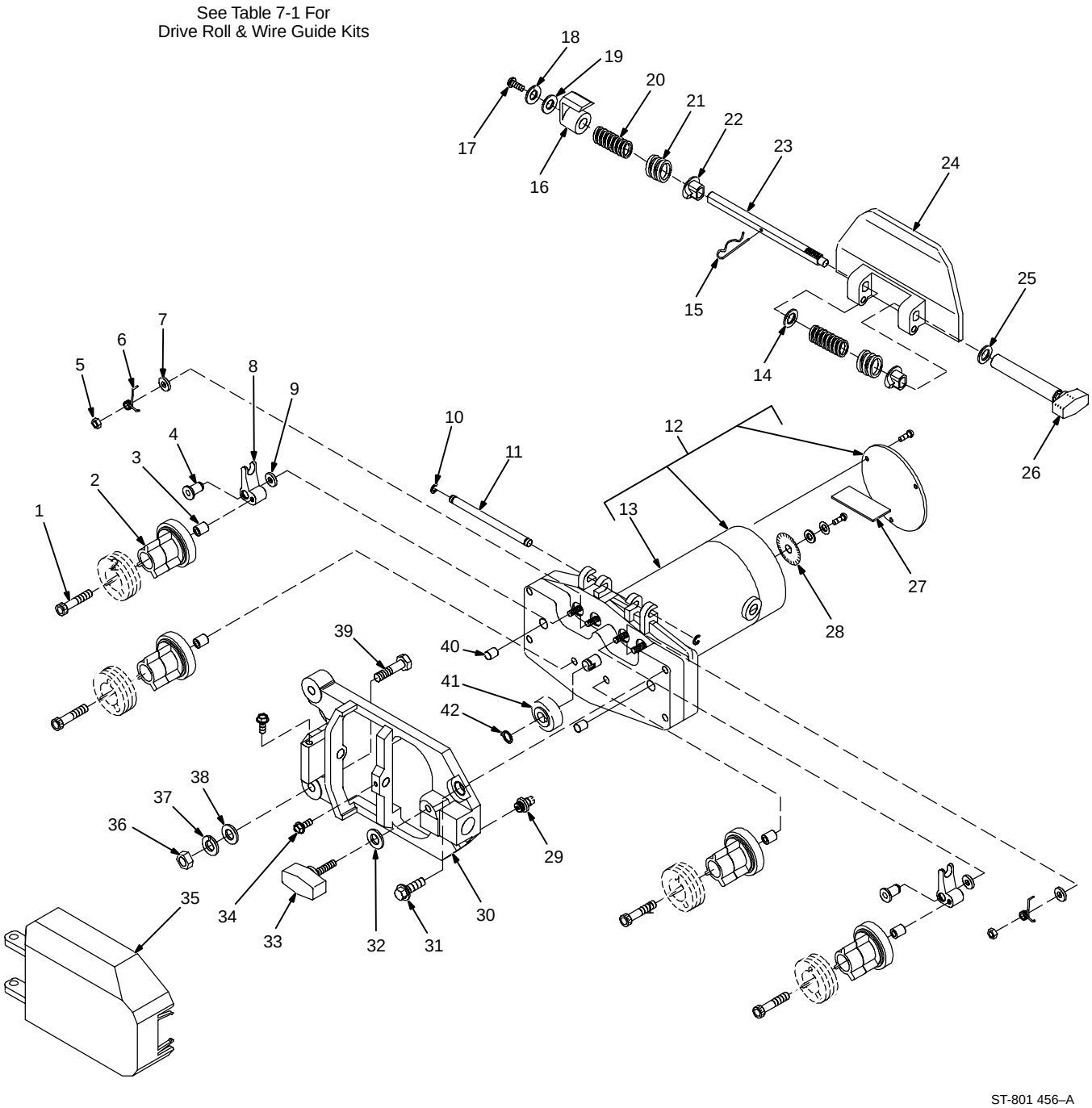


Figure 7-6. Drive Assembly, Wire

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-6. Drive Assembly, Wire (Fig 7-1 Items 29 & 33)	
1		010 668	SCREW, cap stl sch .250-20 x 1.500	4
2		172 075	CARRIER, drive roll w/components 24 pitch	4
3		149 962	SPACER, carrier drive roll	4
4		149 486	PIN, rotation arm rocker	2
5		163 282	NUT, .250-28 stl	2
6		165 798	SPRING, pressure arm retaining	2
7		165 799	WASHER, flat .257 ID stl	2
8		132 750	ARM, pressure	2
9		150 520	SPACER, rotation pin	2
10		133 493	RING, retaining ext .250 shaft x .025thk	2
11		133 350	PIN, hinge	1
12	M1,2	156 354	MOTOR, gear 1/8hp 24VDC 272RPM (consisting of)	1
12	M1,2	♦156 353	MOTOR, gear 1/8hp 24VDC 500RPM (consisting of)	1
		153 491	KIT, brush replacement (consisting of)	1
		153 492	CAP, brush	2
		*153 493	BRUSH, carbon	2
13		155 098	KIT, cover motor gearbox (consisting of)	1
		153 550	COVER, motor gearbox (consisting of)	1
		155 099	GASKET, cover	1
		155 100	SCREW, cover	5
		133 493	RING, rtng ext .250 shaft grv x .025thk	1
		184 136	KIT, brush holder	1
14		182 414	WASHER, flat	1
15		182 415	PIN, cotter hair	1
16		137 248	SPRING, indicator	1
17		129 351	SCREW, hexwhd-slt stl slffmg 8-32 x .500	1
18		602 200	WASHER, lock stl split No. 8	1
19		604 772	WASHER, flat stl SAE No. 8	1
20		182 156	SPRING, cprsn	2
21		182 155	SPRING, cprsn	1
22		132 746	BUSHING, spring	2
23		181 522	SHAFT, spring	1
24		132 747	CARRIER, shaft	1
25		133 739	WASHER, flat .375 ID x .625 OD x .062	1
26		183 330	KNOB, extension	1
27	PC51	198 004	CIRCUIT CARD, digital tach (consisting of)	1
	PLG57	131 204	CONNECTOR & SOCKETS	1
		604 311	GROMMET, rbr .250 ID x .375mtg hole	1
	PLG58	131 203	CONNECTOR & PINS	1
28		132 611	OPTICAL ENCODER DISC	1
29		149 959	FITTING, brs barbed M 3/16tbg x .312-24	1
30		179 265	ADAPTER, gun/feeder LH	1
31		108 940	SCREW, cap stl hexwhd .250-20 x .750	4
32		604 538	WASHER, flat stl SAE .312	1
33		151 437	KNOB, plstc T 1.125 lg x .312-18 x 1.500 bar	1
34		128 237	SCREW, hexwhd-slt stl slffmg 10-32 x .500	2
35		+179 263	COVER, drive roll (consisting of)	1
		178 937	LABEL, warning electric shock and pinch	1
36		601 872	NUT, stl hex full .375-16	1
37		602 213	WASHER, lock stl split .375	1
38		602 243	WASHER, flat stl .375	1
39		601 966	SCREW, cap stl hexhd .375-16 x 1.250	1
40		167 387	SPACER, locating	2
41		168 825	DRIVE, pinion 40T 24P .376 bore	1
42		133 308	RING, retaining ext .375 shaft x .025thk	1

♦Part of 132 129 Optional High Speed Motor

*Recommended Spare Parts.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

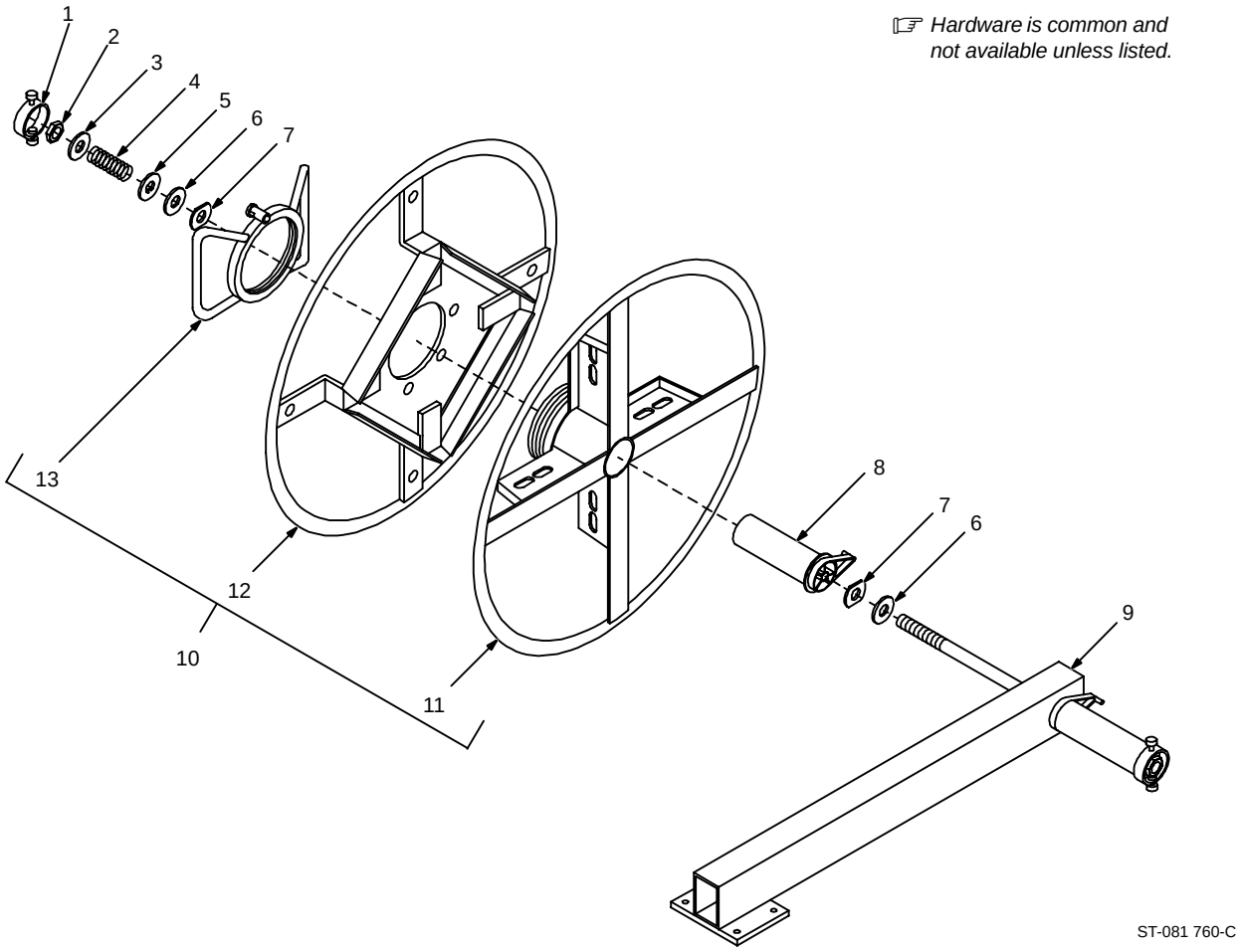


Figure 7-7. Support, Hub & Reel

Item No.	Part No.	Description	Quantity
		Figure 7-7. Support, Hub & Reel (Fig 7-1 Item 12)	
1	058 427	RING, retaining spool	2
2	136 684	NUT, stl slflkg hex reg .625-11 w/nyl insert	2
3	605 941	WASHER, flat stl .640 ID x 1.000 OD x 14ga thk	2
4	010 233	SPRING, cprsn .970 OD x .120 wire x 1.250	2
5	057 971	WASHER, flat stl keyed 1.500dia x .125thk	2
6	010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	4
7	058 628	WASHER, brake stl	4
8	058 428	HUB, spool	2
9	080 393	SUPPORT, reel	1
10	♦108 008	REEL, wire 60 lb (consisting of)	2
11	124 900	SUPPORT, reel spool	1
12	+168 104	RETAINER, spool support (consisting of)	1
	166 594	LABEL, caution falling wire reel can cause damage	1
13	168 103	NUT, spanner retaining	1

♦ OPTIONAL

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Table 7-1. Drive Roll and Wire Guide Kits

Wire Size		Inlet Guide	Intermediate Guide	V-GROOVE		U-GROOVE		VK-GROOVE		UC-GROOVE	
Fraction	Metric			4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll
.023-.025 in.	0.6 mm	150 993	149 518	151 024	087 130						
.030 in.	0.8 mm	150 993	149 518	151 025	053 695						
.035 in.	0.9 mm	150 993	149 518	151 026	053 700	151 036	072 000	151 052	132 958		
.040 in.	1.0 mm	150 993	149 518	161 189	053 696						
.045 in.	1.1/1.2 mm	150 994	149 519	151 027	053 697	151 037	053 701	151 053	132 957	151 070	083 489
.052 in.	1.3/1.4 mm	150 994	149 519	151 028	053 698	151 038	053 702	151 054	132 956	151 071	083 490
1/16 in. (.062 in.)	1.6 mm	150 995	149 520	151 029	053 699	151 039	053 706	151 055	132 955	151 072	053 708
.068-.072 in.	1.8 mm	150 995	149 520					151 056	132 959		
5/64 in. (.079 in.)	2.0 mm	150 995	149 520			151 040	053 704	151 057	132 960	151 073	053 710
3/32 in. (.094 in.)	2.4 mm	150 996	149 521			151 041	053 703	151 058	132 961	151 074	053 709
7/64 in. (.110 in.)	2.8 mm	150 996	149 521			151 042	053 705	151 059	132 962	151 075	053 711
1/8 in. (.125 in.)	3.2 mm	150 997	149 522			151 043	053 707	151 060	132 963	151 076	053 712

Each Kit Contains An Inlet Guide, Intermediate Guide, And 045 233 Antiwear Guide With 604 612 Setscrew 8-32 x .125, Along With 4 Drive Rolls.
2 Kits Required For Dual Models.

S-0549-D

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This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

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Purchase Date (Date which equipment was delivered to original customer.)

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	Welding Process Handbooks
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